

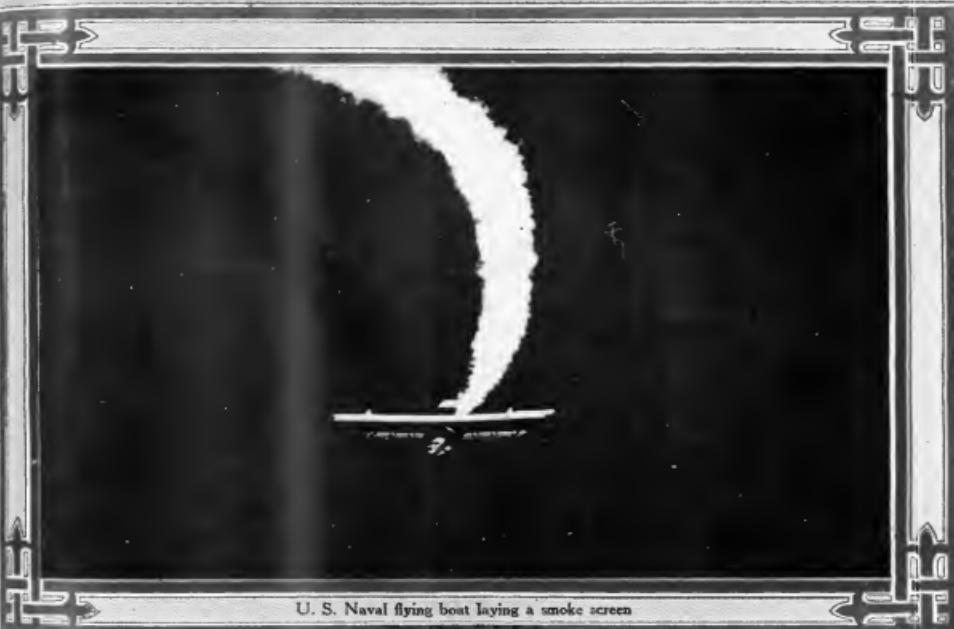
# AVIATION

*The Oldest American Aeronautical Magazine*

DECEMBER 24, 1923

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U. S. Naval flying boat laying a smoke screen

VOLUME  
XV

NUMBER  
26

## SPECIAL FEATURES

THE SUCCESS OF SKYWRITING  
U. S. RIGID AIRSHIP ZR3 DESCRIBED  
FOREIGN ENGINES FOR LIGHT PLANES  
ANNUAL REPORT OF THE AIR MAIL SERVICE

THE CARDNER, MOFFAT CO., INC.

HIGHLAND, N. Y.

225 FOURTH AVENUE, NEW YORK





## NATIONAL AIR

Independent authorities agree that the airplane is now ready for commercial transportation. A Martin Bomber, for instance, carrying 1600 pounds in addition to passenger weight, recently developed an average speed of more than 114 miles per hour.

Railroads have worked for years to clip minutes from their schedules. Present policy is even reducing rather than increasing speed. Travel by rail seems to be fixed for a long time to come

at 60 miles per hour.

How will the development of the airplane affect the country? The railroads welded a loosely federated group of states into a nation. How closely knit will this nation become when its very air is nationalized?

Martin men not only feel the responsibility of maintaining their own leadership - but also the obligation, and the privilege, of building soundly for a whole people.

**THE GLENN L. MARTIN COMPANY**  
CLEVELAND

Builders of Quality Aircraft since 1909

L. D. CARRIER, PRESIDENT  
W. D. MORSE, VICE-PRESIDENT  
L. D. MURKIN, TREASURER  
GEOFFREY NORMAN, GENERAL MANAGER

Vol. XV

# AVIATION

DECEMBER 24, 1923

LAWRENCE E. CLARK

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CONTRIBUTING EDITOR

No. 26

### Russia's Bid for Air Power

**A**LTHOUGH it has repeatedly called attention to the remarkable fact that Soviet Russia is making a serious and outstanding effort to become a first class air power, some recent events, which appeared in the daily press as well as in English, French and Italian periodical organizations, indicate that these efforts are beginning to bear fruit.

The Russian air force, which two years ago was mounted on an extraordinarily heterogeneous assortment of obsolete aircraft—rapidly being equipped with up-to-date machines. All the new equipment, furnished by European manufacturers—double observation planes from Italy, DH.9A day bombers and Spatriots fighters from England, Haerfest training planes from France—but for some time have been streaming into Soviet Russia. And now a cable despatch from the Hague announces that the Fokker Company is working on a Soviet order for 300 present planes, and that large numbers of these ships have already been shipped to Russia after being passed by a Russian testing commission which is staying at Amsterdam. In fact, should any doubt exist regarding the military nature of these ships—which have been misnamed as “transport planes” in some newspaper reports—it will be sufficient to recall that the customs house at Riga, Latvia, recently detained a consignment of Fokker fighting planes destined for Moscow.

Military experts are of little use without well trained pilots. Hence, the report that one hundred and ten cadets of the Russian air force have just obtained their superior pilot’s brevet at the Moscow military flying school will prove of timely interest. Nor is it less interesting to learn that the General of Commissars has approved another emergency appropriation of 1,000,000 gold rubles for the purchase of military aircraft.

The encouragement given by the division to commercial aviation is no less remarkable than these efforts in behalf of a strong air force. Our readers are familiar with the Moscow-Kouangshing air line, which has now successfully been operated for about two years with Fokker cabin planes. The fleet of the “Derevich,” which operates this service, is now undergoing expansion, while other airways are being opened up by two new Russian air transport enterprises. One of these, called the Volga-Ural Air Fleet, has management a service between Moscow, Kharhoff and Odessa, using Dornier “Komet” cabin planes with Rolls Royce engines. The other enterprise, the “Dobrolet”—which appears to be the air transportation arm of the Russian Junkers enterprise—is engaged in the gigantic project of connecting Moscow, across Siberia, with Vladivostok, Russia’s great seaport on the Pacific Coast. A pioneer flight of 2300 miles’ length has already been accomplished on this route toward the East, while other pioneer flights have been made into Central Asia and Persia with a view to linking up these regions with Moscow.

The breadth of vision of these projects is truly amazing, considering the financial status of Soviet Russia, but what is even more astounding is that these plans are actually being carried out. For those unfamiliar with Russia’s geography, suffice it to point out that the Moscow-Vladivostok project spans of distance and ground organization compares roughly with an airway from New York to Rio de Janeiro.

If American civil aviation had a spokesman in Congress, the paramount importance of pushing American air lines—and the Air Mail Service, in the first place—into Mexico, Central and South America could perhaps be impressed upon his makers with sufficient force to make them vote the necessary appropriations. But as civil aviation is, strictly speaking, neither within the province of the Army, the Navy, the Post Office Department or the Department of Commerce, or any other government department, it would not be surprising if Vladivostok found itself looked up to by air with Moscow and the rest of Europe long before American commercial aircraft will skirt the flag south of the Rio Grande.

### A Great Loss

**W**HEN the cables brought word that Lawrence Sperry, the heart of every American aviator was saddened. Not only had we lost one of our most capable pilots and ingenious mechanical experimenters, but a bravely buoyant spirit whose natural elation seemed to be the open spaces of the sky.

As a flier Sperry had no peer. His coolness in intercepting the swoosh of every whiz of current, his pioneering spirit was ever present. The automatic stabilizer, the air flavor, the landing skid, contact flying, and many important than all else, the flying torpedo, will always be associated with his name. While no generally known, it was in connection with the latter development that he was in Europe. Not receiving sufficient recognition at home, he took the naval course of greatest interest abroad to create an impression here.

Everyone will feel a personal loss in the result of this tragic accident, for Lawrence Sperry probably had a wider circle of friends than any other American aviator.

### The Annual Air Mail Report

**T**HIS annual report of the Air Mail Service, which is printed in the issue, serves as a timely reminder of the wonderful work done year in, year out, by this service. The performance percentage of 94.72 made last year, shows what can be accomplished in commercial aviation by organization.

It is hoped that Congress will bear this in mind when next year’s Air Mail appropriations are discussed, and that it will grant this service the means for further developing its activities.

# Review of Foreign Engines for Light Planes

## Adaptation of Motorcycle Engines Giving Way to Special Horizontal and Vertical Types

The interest shown by many of our readers in the rapid strides the light plane movement is making in England and in France makes it timely to give here a brief review of the principal engines used for powering these small aircraft.

Very few engine manufacturers have special engines for this purpose. Among them the Bristol "Cherub" gives a full description of which appeared in our issue of March 26, 1923, deserves special mention for being the only low-powered aero engine that successfully passed an endurance test of the kind to which large aircraft power plants are subjected.

### Bristol "Cherub" Power 50 h. p. Test

This little engine, which was designed from the Lycoming motor on account of its cylinder capacity, 1,000 cu. cm.,



Fig. 1. Bristol "Cherub" 2-cylinder horizontal-opposed type engine, rated 16 hp at 2,500 r.p.m. Weight, 55 lb.

recently completed the 50 hr. "Type Test" of the British air ministry in one instance run at 60 per cent load power.

The tests were made on a Pott's dynamometer. The average power developed during the run was 15.1 kg. of 2,200 r.p.m. The average consumption of fuel for the 50 hr. run, P.T. was 0.7 liters of gasoline per hour, and 0.63 liters of oil per hour. The engine was run on the dynamometer at a fan driven by the engine until the engine reached 50 hr. endurance. At the completion of the 50 hr. endurance test, without any dismantling or adjustment of the engine, the following power test was taken:

S.P.M.	H.P.P.
2,000	18.2
2,200	18.8
2,400	19.4
2,600	19.2
2,800	19.0
3,000	18.8
3,200	18.6

The engine was then run for 3 hrs. at full throttle, developing 23.0 kg. at 2,500 r.p.m. At the conclusion of these tests the engine was completely stripped, measured, and found to be perfectly in perfect condition.

The principal specifications of the Bristol "Cherub" engine are given in Table I. The ANEC light plane which first got out was fitted with this engine, although for the purposes of the Lycoming motor test, the maximum cylinder capacity allowed was 750 cu. cm.—the plane was equipped with a 750 cu. cm. Blackstone engine.

"We used Lycoming, as recommended in England, because we assumed—

Lack of special aircraft engines that would be within the cylinder limitations imposed, was responsible for the fact that at Lyons all the English motorcycle and motor-car engines would have to be used much longer in their capacity, now the small light planes definitely proved the right to existence, the specifications of the engines used in the English models will prove of interest. This is why they are given. Table II. English motorcycle engines are always specified in inches units, and then there are they are listed here. For purposes of conversion it is sufficient to state that one cubic inch units, or .061 cu. in., equals 1.062 cu. in., and that one cubic centimeter equals 0.061 cu. in.

It will be noted that these engines are all of the two cylinder opposed type, with a very high crankshaft speed, which necessitates a reduction gear in the propeller. The figures given under "normal horsepower" are those used for flying purposes, and not as rated by the manufacturers for use in

### The English Motorcycle Engines

The A.R.C. engine was used in the "Wasp" and ANEC light plane, which denied first prize for greatest distance (from one gallon (British Imperial) of gasoline, the per tonnages being 7.5 miles). The ANEC plane also was the altitude winner with 15,484 ft. On the Hendon Page light plane, this engine gave some trouble, as account of a main bearing which had to be replaced.

The Blackstone engine received the Avro biplane which was the aggregate engine competition with a performance of 2,000 m., accomplished in only laps of a 12.5 m. race. Last year, this engine won second place in account of a main bearing which had to be replaced.

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As will be seen from what follows, the first French light plane entries were all of the two cylinder horizontal-opposed, opposed type, and it is only recently that three and four cylinder engines of low power were produced. The reason given for this is that the engine must be a two-cylinder to save weight, and a two-cylinder is the power unit of the aircraft, and furthermore stabilizes the engine rather badly.

The two cylinder radial type is less open to this objection, but still has the drawback of a moving cylinder as occurs with, in our estimation, to outweigh the advantages of low moment weight made possible by the use of a central or side cylinder.

French engine manufacturers seem to be fully aware of this problem, and the latest light plane designs are of the four cylinder vertical type, which is the

process of five cylinder radial engines already forecast.

Table II gives the specifications of these modern French light plane engines which have actually flown. It does not include one, Darracq which is believed to have never been



Fig. 2. Left: Douglas motorcycle engine mounted on the Hindsight light plane; right: Blackstone engine, mounted on the ANEC light plane.

to the Gasolene "Gull" radio-aereo monoplane, the engine did not prove so satisfactory, for the pilot had a forced landing an instant of a cracked cylinder.

Three models of Douglas engines participated in the Lycoming meeting, but specifications are available only for the Lycoming model. The first participation in the Lycoming meeting was with the Gasolene "Gull" radio-aereo monoplane, the engine being 750 cu. cm. The Avro light plane which was used altitude gains, with 0.63 liters of gasoline per hour, was also equipped with this engine. The other two types of Douglas engines did not perform so well. The 600 cu. cm. engine used in the R.A.E. Avro Club ("Hercules") proved unsatisfactory, and the 500 cu. cm. engine did not live up to the promise of any engine.

The 750 cu. cm. Douglas engine, with which the D.H.B.F.

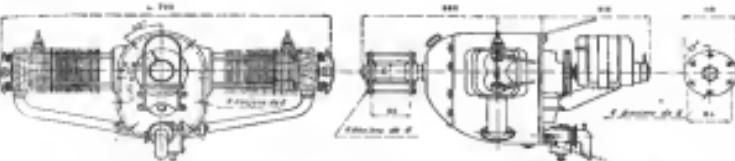


Fig. 3. General arrangement drawings of the Clerget 10 hp. engine for light planes (Dimensions in millimeters).

the Verville "Vigil," the Handasyde and one of the Parnall "Foxes" were fitted with the latter satisfactory at all. With the exception of the "Fox," the other light plane engines have been for one reason or the other (large crank-shaft, bottom rocker arm and other non-specified reasons). So no criticism is on hand with regard to the English engines which served one of the two Avro biplanes—a machine which for its little size of the vertical two cylinder, two stroke, Daimler engine with which the Gloucester "Gnat" was equipped. Engine troubles kept this plane mostly on the ground.

### French Light Plane Engines

French engine manufacturers have developed quite a number of small engines for use in light planes, as shown in Table III. Although several of these are adopted motorcycle and light plane engines, the Avro and the Speranza are probably the best of the lot, although they have yet to pass an engine test comparable to that accomplished by the Bristol "Cloud."

As will be seen from what follows, the first French light plane entries were all of the two cylinder horizontal-opposed, opposed type, and it is only recently that three and four cylinder engines of low power were produced. The reason given for this is that the engine must be a two-cylinder to save weight, and a two-cylinder is the power unit of the aircraft, and furthermore stabilizes the engine rather badly.

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process of five cylinder radial engines already forecast.

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include, but of which no particulars are on hand. Also, the Bristol Co. is developing a two cylinder vertical water-cooled type, with a bore of 60 mm. and a stroke of 106 mm., which is expected to develop 30 hp.

The following notes will give our readers a general idea of the present status of the English and French in the accompanying table, as well as of the qualities these have demonstrated in flight in various trials and competitions.

The Avro has the distinction of having powered the first successful light plane, namely, the Darracq, which Bristol took up for its initial trials on April 6, 1923, at Teddington, England. This is quite an historical date, considering that up to the very time the Avro was a "toy surprise" fitted with "sooty gristle" and classified as a "sporting" biplane, and particularly in the light of the recent victories of Lorraine and these expert, large biplane aerobatic fliers, while great improved light planes are being produced, even though not in the United States, we regret to say.

Let us look at the constructional features of this Avro engine, which was originally rated 8.4 kg. at 1,850 r.p.m. It gave 1.65 little reserve power to the Darracq, and the latter was therefore reduced to 1.2 kg. Darracq, however, which was the power plant used in the famous flight across the English Channel, May 6, 1923. The same Avro engine was later fitted to the Belgian Pionnier light plane, but here, too, it was required to give up little power, and a long tail engine was substituted for the longer nose.

**Two Cylinder Horizontal Types**

The Clerget engine used in the cross-Channel flight was built by the Bristol Co. who held the Clerget patents, for the Clerget 100s Cm. which built the whole Clerget series was discontinued last summer, and the characteristics given in Table II are those of the new model, 2A. The accompanying schematic drawings give a general idea of this power plant as it will be seen that of the horizontal opposed type, which is available, the illustration shows that the 40 mm. diameter engine seems very acceptable. The drawbacks of this engine, the position of the aluminum alloy, while the cylinders and fins are of cast iron, with cross-side cylinder heads. The valves are operated by means of push rods. Lubrication is of the pressure type. The carburetor is equipped with an adjustable float valve which will provide the correct value of fuel.

The power curve indicates 10 kg. at 1,000 r.p.m., 13 kg. at 1,400 r.p.m., 14 kg. at 1,500 r.p.m., 15 kg. at 1,600 r.p.m. and 16.5 kg. at 1,800 r.p.m. The overall dimensions of the engine are as follows: Width overcast, 3,200 m., depth, base and side, 9,880 m., height, 0.325 m. The propeller is direct drive.

The 10 hp. Clerget 2A engine has successfully been used on certain Deperdussin light planes as powerplant at the "Grand Prix de la Moto-Aviation" and the Voisin meeting, last July and August.

The Clerget two cylinder horizontal opposed engine, which was exhibited at the Paris Aero Show, last winter, is undoubtedly an experimental job. It is characterized by a very high crankshaft speed, 3,600 r.p.m., which is reduced as the propeller passes in use by means of a planetary gear. It



Fig. 4. Clerget 2-cylinder horizontal opposed type engine, rated 10 hp at 1,800 r.p.m. Weight, 60 lb. This engine, being in earlier model, differs in some particulars from the one shown above.



# Annual Report on the U. S. Air Mail Service

Mail Planes Flew 1,600,000 Mi. with 67,800,000 Letters  
Making 96.72 Per Cent Performance

The annual report of the Postmaster General, just made public, contains some very interesting information on the operation of the Air Mail Service during the fiscal year ended June 30, 1923. This is reproduced below.

The operation of the Air Mail Service during the period under review was confined to one transcontinental route from New York to San Francisco, and the details on that route are located at the end of this article. Below, the Postmaster General's statement on the other routes is summarized:

On June 30, 1923, the Air Mail Service had 78 airplanes in flying condition.

The Air Mail Service inventory, as of July 1, 1923—when fifteen fields and fourteen route stations were added—is as follows:

**Locations:**

Broadway and Webster Ctr.	8,600 ft.
Alameda (1)	1,000 ft.
Orlando (1)	2,000 ft.
Others (1)	2,000 ft.
	14,600 ft.

—14,600 ft.

# Skywriting - A Successful Commercial Activity

Planes of Skywriting Corporation of America Extend Operations over Entire Country



Photo Courtesy-Skywriting Corp. of America  
A skywriting SESA plane

Among the commercial activities in which airplanes are being used with notable success, skywriting would top the list of advertisement and publicity, though of comparatively small savings, has quickly risen to a place of considerable importance. Though this phase of commercial aviation is but a year old, an unusual growth in this country, through the nation-wide activities of the Skywriting Corp. of America, whose headquarters at 50 E. 51st St., New York, has been very rapid.

## The Equipment

In January of this year one skywriting plane of the first commercial operations, Today fourteen planes have been equipped for skywriting, and twelve are in active use. The planes are single-seaters, each fitted with 720 h.p. Wibault "Vigil" engines, and have a top speed of 125 m.p.h., and a climb of 10,000 ft. in 11 or 12 min. Each of these planes has now flown approximately 120 hr., having a total flying time for the skywriting fleet of 1,600 hr. During this time every plane has been equipped with either a new engine or one that has been completely overhauled.

Skywriting planes have flown over territory from Bangor, Me. to San Diego, Calif. and from Seattle, Wash., to Jacksonville, Fla., and have written messages in the sky over

nearly every important city and state in the Union, with the exception of one or two Middle Western states, where there are no flying facilities at all.

An idea of the great distances covered by skywriting planes may be illustrated by the flight of Pilot C. B. Gill from New York, round trip, to Atlanta, Ga., via Detroit, Mich., New Orleans, New Mexico, and San Antonio, with stops at Chicago, Des Moines, St. Paul, Minneapolis, Kansas City, Wichita, Oklahoma City, Fort Worth, Dallas and San Antonio.

We had no trouble of any kind in this long flight and gave skywriting demonstrations over all the big cities en route.

## The Operating Basis

The main base of the Skywriting Corporation is at the Field, Garden City, one of the largest airports in the field, together with a smaller hangar, being occupied by its shape. At Framingham, Mass., the company has rented from the State the former Army Air Service flying field and has made a larger hangar there for the purpose of skywriting. For operations in Pennsylvania and New Jersey fields at Gladstone Farms, Kirkwood, N. J., has been rented and a hangar erected by the company. In Illinois, the skywriting planes have also been assigned, located at Ardmore Field, which is operated by the Aero Club of Illinois. On the Pacific Coast operations are carried on from Los Angeles.

John J. Conner, president of the Skywriting Corporation, became interested in skywriting while on a trip in Europe in the fall of 1929. Maj. Jack Savage, of London, England, who is the founder of the present form of skywriting, gave the first public demonstration in London in May, 1929. Conner realizing the immense possibilities of this type of advertising in America, promptly entered into negotiations with Major Savage, and these resulted in the creation of the American company.

Maj. Savage and Mr. Conner have created an organization of famous pilots for skywriting operations. Seven of these are attached to the American company—Captains



The staff of the Skywriting Corp. of America—(L. to R.) Lt. H. J. Mefj, Jeff Savage, Capt. G. A. Loughlin and Alber J. Conner, president of the company

Sgt. Turner, A.F.C., G.A. Loughlin, B.F.C., E.D.C. Heron, George F. Brady, Leslie Test. Cos., G. E. McMullen and Wm. Collyer, all well-known pilots with brilliant war records. Pilot Collyer was formerly a well known fast in the U. S. Air Mail Services before joining the Skywriting, while Captain Heron, McMullen and Brady were pilots for Brady Transport Company, Denver, Colorado and Indiana Air Lines, respectively.

The general organization of the Skywriting Corporation consists of sixteen expert mechanics, engineers, etc., under the direction of Superintendent George Cook. There are also representatives attached to the company, who proceed ahead of the units and arrange for landing fields and supplies.

It is interesting to note that every man in the Skywriting corps is a war veteran during the World War.

## An Interesting Engine

The Peugeot Automobile Co. of Paris, France, is reported to have completed the construction of a new aircraft engine that will burn vegetable and kerosene oils. This engine is of the two stroke, two cylinder type, and is expected to develop 100 h.p. at 1500 r.p.m. The weight, dry, is said to be 44 lb.

The engine is of the test-tube type and uses a compression ratio of 12 atmospheres. It can be started "cold," the initial "kick" being done by a short piece of platinum wire, assist J. in the combustion chamber and heated to white heat by means of electricity furnished by a small storage battery. It has intake and exhaust ports, and the scavenging is done by a small compressor. The cost of it is reported as a high figure.

First tests of this motor will take place shortly. In this connection it is interesting to learn that the Peugeot Co. will shortly send several motorcars automobile on a trip across the greater breadth of Africa, from Dakar to Capetown, and thence to Cairo and Constantinople, for the purpose of securing an automobile which can run on vegetable oil, such as that described above. This engine will burn vegetable oils which are either readily available in Africa or can be easily purchased on the spot.

The French government is giving strong encouragement to the development of power plants for automobiles vehicles that will operate on fuel oil, either gasoline or kerosene, as the world's oil supplies are all controlled by American or British interests, and it is felt that these sources of supply might not remain available in case the United States or the British Empire were involved in a war.

## New Members A.C.C.

The following corporations and individuals were recently elected to membership in the Aerospace Chamber of Commerce of America, Inc.—

### Class II

Hannover, Schlesinger & Co., hardware, New York City  
The Moto-Motor Co., industrial Birmingham, Long Island City

High Jaw Advertising Corp., New York City  
W. H. Morris Thawers & Co., Inc., Takoma, New York City  
Tissot, Inc., Dept. Union, N. J.

### Class C

Rival Studios, L.W.E. Engineering Corp.  
Joseph F. Mendis, Curtis Aeroplane & Motor Co.  
Editor's—Aero Engineering Corp., New York City

## N.A.A. Committees for 1924

The National Aviation Association has just announced the personnel of the various standing committees for the present year. The names of these officers, appointed by Frederick D. Patterson, president of the N.A.A., and approved by the Executive Committee, are given in the right-hand column.

## N.A.A. OFFICERS FOR 1924

**President**  
Frederick D. Patterson  
**Vice-President**  
Ralph H. Cross  
**Treasurer**  
B. F. Gott  
**Secretary**  
Dudley M. Osborn

**Finance Committee**  
Edgar C. Coffey, Detroit, Mich.  
Col. B. F. Coffey, New York City  
Godfrey L. Collier, Boston, Mass.  
C. J. Kettering, Dayton, Ohio  
Edgar Ford, Detroit, Mich.  
Capt. F. G. Hayes, St. Louis, Mo.  
Cecil H. DeMille, Hollywood, Calif.  
Charles C. Johnson

Col. F. P. Lederle, Washington, D. C.  
H. Russell Stark, Washington, D. C.  
Carl Schurz, Washington, D. C.  
Porter Adams, Boston, Mass.

C. G. Peterson, Paterson, N. J.  
George W. Patterson, Washington, D. C.  
James A. Morrison, Birmingham, Ala.  
Giles L. Martin, Cleveland, Ohio  
Ralph Updegraff, Detroit, Mich.

E. W. Schreiber, Chicago, Ill.  
Howard F. White, Kansas City, Mo.  
William E. Williams, St. Louis, Mo.  
H. E. Morris, Toledo, Ohio  
Lt. Col. C. C. Calfee

**Membership Committee**  
F. D. Patterson, Detroit, Mich.  
Ralph W. Cross, Davenport, Iowa  
W. F. Fallon, Washington, D. C.  
John E. Aldrich, Dayton, Ohio  
Dr. J. Frank Powers, St. Louis, Mo.

Dr. E. R. Ferguson, Chicago, Ill.  
Joseph Brady, Syracuse, N. Y.  
Harold Hartney, Washington, D. C.  
Gard F. Frisch, Detroit, Mich.  
Charles J. Gladden, New York City  
Percival C. Gandy

H. W. King, Dayton, Ohio  
John Pettus, Cincinnati, Ohio  
George S. Whist, New York City  
Elmer W. Roberts, Detroit, Mich.  
K. M. Findley, Washington, D. C.  
Archibald Black, Grand Rapids, Mich.  
Walter Clegg, New Orleans, La.  
E. K. Nichols, Atlanta, Ga.  
Clark Howell, Atlanta, Ga.

Charles Boggs, Oklahoma City, Okla.  
George Kohlmann, Cincinnati, Ohio

John S. Lohm, Park, France  
Robert W. Velt, Park, France  
John J. Velt, Park, France  
John E. Velt, Park, France  
E. C. Joseph Peltier, St. Louis, Mo.

Prof. E. P. Warner, Boston, Mass.  
Elmer Sperry, Brooklyn, N. Y.  
Dr. A. L. Heppell, Paris, France

**Legislative Committee**  
W. F. Coffey, Coffey, Jr., Chicago, Ill.  
Edward H. Knobell, Detroit, Mich.  
Stephen J. McMahon, Milwaukee, Wis.  
Ray G. Fitzgerald, Dayton, Ohio  
Edgar D. Wilder, Detroit, Mich.

W. Frank Carter, St. Louis, Mo.  
Alfred E. Clegg, New Orleans, La.  
David Dote, Omaha, Neb.  
Raigh W. Cross, Davenport, Iowa  
Marvin M. Johnson, Boston, Mass.

# World's Largest Airship Nearing Completion

ZR3, Built by the Zeppelin Co. for the U. S. Navy Department  
To Cross Atlantic Next Spring

The most advanced airship in its modern form is a German conception which received its highest development by the Zeppelin Co. at Friedrichshafen, Germany, designed by Count von Zeppelin over twenty-five years ago. Germany, under the Versailles Treaty, was restricted by the Allied Powers from building other than commercial airships of a gross capacity not greater than 70,000 cu. m. This has in no small way retarded the development of the dirigible type, while it gives the Atlantic to such a small ship as would not be able to compete.

The Allied and Associated Powers, however, made no exception to this restriction, for they authorized the United States government to have constructed in Germany a rigid airship of 30,000 cu. m. capacity, nearly two and one-half times as large as Germany is ordinarily permitted to build. This ship is to be subject to the condition that it will not be used for military purposes.

## Embodies Latest Practice

The United States Navy Department is the government department charged with the development of rigid airships. The Navy Department accordingly entered into negotiations with the German government and the Zeppelin Co. to construct a commercial type airship of approximately 30,000 cu. m. capacity, and upon its completion to deliver it by a German ship to the U. S. Naval Air Station, Lakehurst, N. J. This airship was to include the very latest knowledge of the Zeppelin Co., particularly as regards provisions for adequate strength and safety.

All details in connection with these contracts were completed the latter part of June 1922, and early in July the inspection department of the Navy Department took up their residence in Friedrichshafen, where the main plant of the Zeppelin Co. is located.

The Navy Department had full confidence in the recognized ability of the Zeppelin Co., but, in order that the Navy Department might be convinced that this ship would represent the "last word" known to the art, it stationed its representatives at the Zeppelin works in time to follow the construction day by day. The Zeppelin Co. on the other hand was anxious to demonstrate its great experience in airship building, and cordially received the Navy Department's representatives.

## Sizes of the ZRS

The size of this airship at the nose as the latest airships built by the Zeppelin Co. at the end of the war, namely, a gross capacity of 15,000 cu. m. The ZRS has, however, been designed specially to accommodate passengers, and particular attention has been directed to all factors involving convenience, comfort and safety.

The greatest dimensions of the ship are as follows:

Gross length 300 ft.  
Maximum diameter 32 ft.  
Maximum width 40 ft.  
Minimum height (including bottom keel) 102 ft.

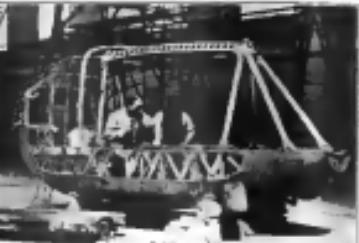
More figures, however, do not give an adequate conception of the tremendous size of this great aerial liner. Making the ZRS has ever been handled. A better idea of the ship's dimensions may be obtained by comparing the size of the largest of flying boats with that of the "Queen of the Air." This larger, at the present, is the world's largest ship of such enormous size that the Woodsbury Beach of planed in its side could be placed inside the longer with plenty of room to spare.

## Power Plant

To drive this ship through the air at a speed of 80 mi./hr. more than is required. This is obtained from five 12 cyl. V type Maybach engines of 600 hp each. Each engine is mounted on a separate power car, and the five power cars are distributed along the under side of the ship, and supported

to the airship's framework by means of wire cables and stays.

The engine, which have been designed by the well known firm, the Maybach Motor Co. of Friedrichshafen, which is affiliated with the Zeppelin Co., will contain many new features. They have been especially designed for great endurance and long life, features essential for commercial airships which will make long flights over the sea. One of the new features is that the engines are reversible, thus doing away with the need of reversing gears. All five engines will be pretuned at the factory, so that the ship's flight program can be started very quickly. The pre-tuning feature was introduced in the engines designed for the E-4



One of the five power cars of the U. S. naval airship ZR3, each of which will be fitted with a 400 hp Maybach engine.

Navy submarine chasers during the World War, but this is the first time that feature has ever been incorporated in an aviation machine.

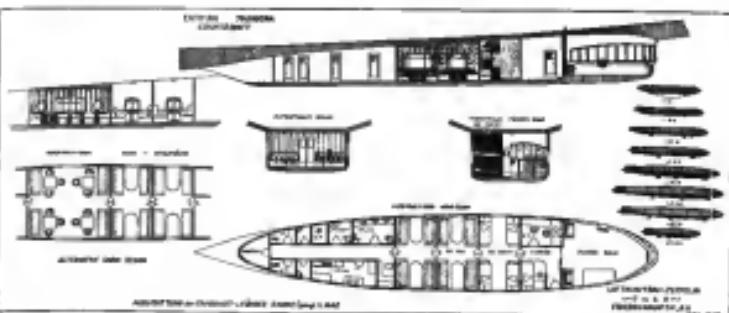
The ZRS will have incorporated as many refinements of design, the results of almost twenty-five years' continuous efforts on the part of the Zeppelin Co. The equipment and accommodations for passengers will be as complete and as comfortable as the Zeppelin Co. is capable of designing, with all their years of experience behind them.

## Luxurious Accommodations

To get an idea of the luxuriant accommodations and lavish staterooms on the ZRS, which will have accommodations for thirty passengers, one has only to recall the equipment on the long ocean liners. The seating and sleeping arrangements compare favorably with the French American Liner company. These quarters are arranged in the main saloon, which is easily accessible from the deck under the forward end of the ship. The passenger saloon is also fitted with a modern type of equipment with steam heat. The gondola will be divided into five compartments, each compartment seating five persons comfortably. The windows are large so as to give the passengers a perfect view of the world beneath. Travel under these conditions will be as luxurious as modern ocean liners. The passengers will have none of the discomforts of transatlantic air travel. The motion in an airship is much less than in a ship, and there are no other disturbances to distract from the pleasure of the journey. Food will suffice for the passengers' needs for extended runs and you can picture the crew of the ZRS, in all about twenty-four men,

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AERONAUTICS



Interior arrangement drawings of the ZRS, as stored for day and night use, of the Zeppelin airship ZRS now building for the United States Navy

there belonging and themselves stored away neatly in hooks to do about the interior running off the wall along the floor of the ship. Quarters are so located that each man will at all times be next to the room of his duty.

The ZRS has been fitted with low mounting equipment so that she may be secured to a mooring mast. Operation in the United States is that the mooring mast will prove to be the factor which will strongly demonstrate the commercial value of rigid airships.

## Extensive Trials Before Crossing

Immediately after the completion of the ship, it will be filled with hydrogen gas, a total of 2,500,000 cu. ft. of hydrogen being required for one filling. To manufacture this amount of hydrogen, 200 tons of oil will be needed.

Several short trial flights of from two to four hours duration will follow, to test that all parts function properly. This will be followed by a longer flight of about 24 hr. This flight will cover a distance of 1,000 miles and of all the ship's equipment and of course the ship will be flown over bad weather areas to prove its performance and power of resistance.

During the war it was often necessary to place the airships built by the Luftschiffbau Zeppelin (Zeppelin Co.) in service as soon as possible. On account of the great experience of this manufacturer, new airships were sent in the fleet as soon as possible after only one or two short test flights.

The ZRS has the construction number 123185, that is, the ship which the company has built for the Navy. It has the largest type airship previously constructed. This great number is the best guarantee that the new ship will be the last word in the field of aerial construction. It is desired however for the ZRS, to undergo a thorough test to guarantee its safety and performance.

The final confirmation of the airship's usefulness and performance will be obtained through this crossing from Europe to America.

## The Transatlantic Flight

21. transatlantic flight, originally scheduled for last month has been postponed to take place next spring. The route from Friedrichshafen to the East Coast of the United States is the same as the 1922 record flight, while the British 21st Air Race from London to New York, except an average distance of only 2,000 nautical miles,

as is well known, very stormy wind would prevail on December

North Atlantic oceans during the winter months. In the winter months the average wind velocity on the North Atlantic sea level is averaging 27 mi./hr. and at the altitude of flight 20 mi./hr., as the winds are rapidly increasing at the higher levels. As the progress of the sailing in flight will, of course, be increased by the speed of head winds, it results that the crossing time would be considerably increased on this direct route. Furthermore, with the wind going at a crossing speed of 20 mi./hr., the present wind would be 47 mi./hr. which makes it probable that instead of flying the direct, northern route preference will be given to a more southerly course where less violent headwinds are to be expected. As the average west winds in the vicinity of the 30th degree of latitude are considerably less, it is planned to fly from Friedrichshafen to the 30th degree of latitude, pass Cape Finisterre and the Azores Islands, to the south of the Madeira Islands and thence to Lakehurst, N. J. This route would measure about 4,000 nautical miles in length, being nearly one third longer than the direct route over the English Channel, Ireland, Newfoundland and Nova Scotia. On account of the longer distance nothing like a new crossing record must be expected. It is estimated, however, that the ZRS will make the crossing in 10 days, from 75 to 100 hr., that is, in three and four days.

The flight will be made without any intermediate stop and the ship will be navigated by the experienced personnel of the Luftschiffbau Zeppelin. The route on this flight will be composed of over thirty men, and gasoline about of over 35 tons, the occupancy of three railway tank cars, not to speak of the supply of oil, spare parts; water for bulkhead, drinking and washing, and food supplies.

## Interesting Commercial Possibilities

Let us consider the performance of this airship on a regular air line, for example a route from San Francisco to Honolulu (Honolulu), a distance of 2,800 nautical miles. This journey today takes a steamer about five days. Under favorable conditions the ZRS could make the trip in 24 hr. It would be made to Honolulu in 19 hr. more than 20 hr. in the return trip to San Francisco. The difference is due to unfavorable winds which are likely to be found on the eastward trip. It would be possible, for example, to leave San Francisco on a Saturday morning and arrive in Honolulu on Sunday evening. The possibility of using the chief means of advance over Sunday would then exist. The return trip would start in the evening and the arrival could on Tuesday

journey again be in San Francisco, so that the whole journey would be only a little more than a week and try.

On that basis the ZBB could carry thirty passengers and 30 tons of freight or baggage. The flight would be so arranged that connections would be made with steamship sailing from San Francisco to Asia, and in addition the mail could be expedited.

This schedule could also be used for flights around the United States. The New York-Los Angeles-Chicago-New York could be accomplished by the ZBB in about four days (19 hr.) without the necessity for other intermediate landings, because the crew and necessary fuel, a load of ten tons would be available for passengers and freight, that is about twenty passengers and 7 tons of mail or twenty passengers.

On the other hand, if an addition to the crew and the necessary water, fuel and equipment the ship should carry a full load of fuel, it is possible under average conditions and at an operating speed of 60 mph to have a radius of action of 800 miles, i.e., if a deduction of 1000 ft. is made to take care of headwinds, winds (although on such long flights the headwinds are bound to follow) winds (such as a tail wind) the distance which can be flown would be 7000 miles, that is, it would be possible to fly from New York to sea plane on the earth within a radius of 7000 miles. If an air line of a circle is described with New York as a center and a radius of 7000 miles as will be found that this circle lies in the mountains of Central America, Venezuela, Colombia, Ecuador (No. & Esmeraldas), Northern Mexico, and extends to the South Pole, so that all parts of the world with the exception of Australia would be attainable by direct flight by this ship, if it started from New York, while Australia would be within easy reach if the east route were made from San Francisco."

### Book Reviews

**Lar Historique.** By M. Wilhem Mergulsky, Former Director of the Eiffel Laboratory (Catherwood-Vienna, 1922).

Interest in the helicopter has been through a series of cycles. First there was the period of the first experiments and second attempts in calculated ratios as the number of performances improved, but subdivided only to rise again within the past two years, thanks to the partial success obtained by a number of inventors both here and abroad. The experiments of Berliner, de Bothezat, Romanoff, and Karratz and Patterson have stimulated interest again to a point where it looks as though the time is near at hand when it is apparent that the present should bring forth the final detailed study of the possibilities of the helicopter and of the ways on which a helicopter can be improved by the application of the methods of modern aeronautical science.

M. Mergulsky has interested in the testing of propellers and engines of all types the popular work done at the Eiffel Laboratory has presented very interesting material in his well balanced book of some 90 pages. It is devoted chiefly to the explanation of methods of comparing various propellers from the point of view of their usefulness in helicopters and of predicting the possible performance of a given machine. The work is based on a large number of tests of propellers made at the Eiffel Wind tunnel, which are briefly described in such form as to be available to the general public for the first time. These tests have not covered completely the several possible conditions of operation of a propeller, including the operation as a vertical lift when a helicopter is flying horizontally, but they do provide a good foundation for continued purposes of propagation and continuation which are not likely to go the path of trial. Unfortunately, the curves expressing the results of these have been plotted on so small a scale that it is difficult to read the values directly. The shape of the curves

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and the general nature of the variations of the forces are indicated, however, and the conclusion which can be drawn from the curves are discussed by M. Mergulsky in the text.

In addition to formulating the basic principles of the work, the author takes some length when there have been arrived at in other laboratories and reduces them to a concise basis. The most impressive feature of this part of the book is the extraordinarily good agreement among the several sets of experiments. The results secured by Dougan, Hough, and Patterson, the Eiffel et al., in nearly exact agreement. In fact, the Eiffel et al. in nearly exact agreement in finding that the resistance increases in 80 per cent as the angle of attack increases as derived by Fauvelvaldes, Mertens and others. This is true despite the wide variety of the types tested in several laboratories, and is a factor in leading either to the conclusion that "the theory of the two-bladed propeller is not yet a complete discipline," or that "the designer, the engineer, and the pilot appreciate." The blade design and section and the pitch have but little effect within limits, all of which is somewhat disconcerting to those who have predicted great future improvement in the efficiency of propeller performances designed for helicopter use. Further encouragement for the operator and the manufacturer to experiment for themselves is found in the fact that the results of the numerous attempts of regressive types of propellers tested at the Eiffel laboratory have ever shown any improvement over the standard form. The thrust obtainable from a given diameter and power, for example, does not appear to have been very much improved by the use of two propellers as compared to one.

It is rather a remarkable feature of the history of helicopter experiments that every laboratory staff has tried a new type of coefficients as a new basis of comparison. The author performs a needed service in tabulating a number of these coefficients and giving the flavor of transformation due to another, but American readers may regret that the coefficient of lift, for example, in Technical Note No. 4 of the NACA, and others, that extensively used by American experimenters, are not included.

In describing the behavior of propellers, under other conditions than that of propulsion or statics, particularly it is pointed out that under some conditions the propeller acting as a windmill gives several possible speeds of rotation for a given rate of descent, and that the speed may be variable. This is true, however, only when the propeller is not yet operating as a retarding torque. For the treatment of this, as of many other problems, ingenious diagrams have been devised and reproduced in the book, some of them representing application of the Eiffel logarithmic diagrams to this problem, while others are entirely independent of any previous method. The parallel between the helicopter and the airplane is forcibly pointed out in the question of horizontal flight, and a study is made of the possibility of a combination of the two types of aircraft.

The problem of stability and control is hardly mentioned, and it is therefore impossible to say off-hand just what are the author's views on the future of the helicopter. On the author's outline which he passes does not seem to be a large place given to problems of possible methods of obtaining maximum lifting efficiency. His discussions, particularly that part which relates to the means of obtaining increased lift and of predicting possibilities of performance, is of great interest and should receive the attention of every prospective helicopter designer.

**The Face at Sea.** AIR AS SEEN FROM THE SEA. By W. L. Lee. U. S. Geological Survey. 165 pp., \$2.50. (American Geographical Society, New York.)

This beautifully illustrated book deals with the application of aerial photography to hydrography. After discussing the development of aerial photography as a result of war requirements, the author goes on describing the different uses of aerial photographs, oblique and vertical, and their different uses in connection with map making, surveying, meteorology, oceanography, and engineering projects, geology, etc.

What the book is a strikingly good one, and it will be found of interest by all those interested in the most recent commercial applications of commercial aviation.

### L. B. Sperry Lost at Sea

According to press despatches from England, it is feared that Lawrence B. Sperry, the well known aeronautics pioneer and president of the Sperry Aircraft Co., Inc., of Farmingdale, L. I., was lost with his plane in the English Channel on Dec. 15, when en route from England to the Continent.

On Dec. 14, "Messenger," a Sperry biplane, was flying by wireless at Pitts, 9 mi. from Fins, flying seawards at an altitude of about 500 ft. A few minutes later the ship was seen to make hard turns shore, and then fly out to sea again, when

motor running after the plane had disappeared. It seemed extremely unsafe for the aviator to even alight under such circumstances."

At the time of going to press no further news regarding Sperry's fate has been received, although rescue parties searched for the lost aviator for several days. The belief, therefore, is that he may have been drowned in swimming seawards, the sea being very rough and turbulent to be the only reasonable explanation of his sudden disappearance, which will be deeply lamented by all his co-workers and admirers. Advances taken this opportunity of extending to the lost aviator's family the expression of its sincere sympathy in this sudden bereavement.

Lawrence B. Sperry was born Dec. 21, 1890, in Chicago, the son of Elmer B. Sperry and Edith C. Sperry. He received his World War pilot's wings, Feb. 28, 1918, and became chairman of the board of directors of the Sperry Aircraft Co. in 1919, when he started building his own airplane, which he flew the following year, first under sail and then with a motor. In 1921 he obtained a seaplane pilot's certificate, and became manager of the Flying Department of the Sperry Gyroscope Co. of Brooklyn, N. Y., where he developed a gyroscopic stabilizer for seaplanes which won first prize at the French Seaplane Show held near Paris in 1914. The Caudron biplane boat in which this stabilizer was fitted was personally demonstrated by Sperry in France. He was the first to join the U. S. Naval Flying Corps, on Jan. 3, 1917, and during the war was engaged in developing experimental flying torpedoes. Subsequently, he turned his developing work on radio-controlled aerial torpedoes, succeeding last year in flying such a machine across country. The plane was a "Messenger" single seaplane which was built in the Sperry factory to the design of the Engineering Division of the Army Air Service.

Sperry's planck attempt to see the Orkney-Shetland Islands October with a flight from Gordon City has now been abandoned, and he has returned to the use of the airplane as a "Express" which he would load and take off in ships and boats, and return at gasoline stations. His demonstration of the possibility of controlling two airplanes in flight, which previously led to the development of the gyroscopic gyroscope and refueling and the establishing of new world's duration and distance records, and finally, his experiments with sparkless leadless igniting gases and other fuels—all these manifestations of his creative activity stamp Lawrence B. Sperry as a true pioneer of aviation, and one whose name will live in the annals of human art. His untimely disappearance is therefore an irreparable loss to American aviation.



Lawrence B. Sperry

safely about 3 mi. off shore, it dove into the water. It did not burst into flames and floated immediately, but got out in the hope of rescuing the pilot, but when they reached the plane Sperry was nowhere to be found.

The searchers did find, however, an air jacket about a mile from the plane, marked with the British aircraft registration and a flight log, containing the name L. B. Sperry. An aircraft chart and other items were also found. The words "Property of L. B. Sperry" were found near by.

The plane, identified as Sperry's by the fact that his name was printed on the fuselage, was brought to shore apparently undamaged. The engine, from a superficial examination, seemed to be in good running order.

Donald MacCullum, who was shooting game on the coast of the place where Sperry flew seawards, said that the weather regime was unusually bad just before the plane disappeared from view.

"Between noon and 3 o'clock," he said, "I noticed an airplane coming from inland, which held my attention because of the fact that this engine was running very badly, spluttering and sputtering a great deal. The plane was quite low, and I could distinctly hear its motors and engine."

"It circled round twice, and on the first circle was apparently about to land. I was quite sure of this and had started to run toward it when the plane rose and began a second circle. Obviously the aviator was looking for a place to land but afterwards he decided to alight the sea passage."

"The plane was flying very low, and I was unable to land for fear of crashing into the rocks. The dunes there were covered with short grass."

"The engine was still running on flat and starts when the aviator turned his machine toward the sea and disappeared over a wave into the rather thick mist. I could hear the

### Secretary Davis Visits Dayton Fields

**McCook Field and Wilbur Wright Field.** were recently visited by a group of distinguished visitors headed by Mr. Donald F. Davis, Assistant Secretary of War, and Capt. P. F. Hayes, Deputy Chief of Staff, and Maj. Gen. Mason M. Patrick, Chief of Air Service. Col. H. B. Ferguson, assistant to Mr. Davis, Maj. James A. Mays, Chief of the Industrial War Plans Division, Office Chief of Air Service, and Capt. James S. Allen, assistant to Major Mays, were also present.

After an inspection of McCook Field, some exhibitions flying were given for their entertainment. The site for McCook Field was also inspected, and the visitors expressed themselves as agreeing much heartily the plans for the new home for the Engineering Division.

The party visited the Repair Shops at Wilbur Wright Field and manifested great interest in the work in progress in the Aeroplane and Repair Shop. During a visit to the Aeroplane shop, Mr. Hayes, the Acting Director of the Engineering Division, and Capt. H. B. Ferguson, Director of the Design Branch of the Industrial War Plans Committee, and Frederick B. Patterson, President of the National Aeronautic Association and President of the National Cash Register Co.

# AIRPORTS AND AIRWAYS

## Charting the Airways

A few flights from Michel Field to Seattle, Wash., and return was recently made by Louis Victor E. Bertrandius and Robert G. Schaefer, Jr. for the purpose of preparing data on landing, takeoff, and flying directions and routes. The flight was started Sept. 1, and completed Oct. 21. The total distance flown was approximately 6500 mi. and the flying time 83 hr. & min.

The flight was accomplished with one standard DH-4B aircraft, equipped with a 15 gal. oil tank, a McCook Field oil tank, a British Spyder compass, a Vicksburg altimeter, a recorder, and two back seat fare collectors. The progress stood up very well, and a flight in a storm was shown to effect upon it whatsoever. The Spyder instruments proved very accurate. The pilots carried a regular compass on the instrument board, but for some reason or other it went out of order. The "old reliable" latrine compass, which had been used with Shultz pumps, performed to its usual excellent account. The only mechanical trouble encountered during the entire trip were the changing of an voltage regulator, and two distributor heads which had developed niggles around the age limit. The motor and Spyder pump were not changed, despite the different number of hours run on the route.

Standard aviation gasoline was obtained at various landing places, with the single exception of Miles City, where it was necessary to partly fill with commercial gas. The amount of fuel used on the trip was 1570 gal. of gasoline and 4575 gal. of oil. Weather conditions on the westward leg were

favorable on the landing facilities at the various stopping points, Bertrandius makes the following comments:

"At Milwaukee, Wis., there is a commercial field, known as the Milwaukee Airport. This field has one hangar, gasoline and oil service, and a large white circle in center. Field width:

"Landing field at Minneapolis, known as the Wold-Chesson field, is very easy to park up, being an old speedway. Aviation gasoline and oil are available."

"At Bismarck, N. D., there is a government field located at Fort Lincoln. It is situated in advance of the Chamber of Commerce and a visiting point, making all arrangements for gasoline and oil."

"At Miles City, Mont., there is a small field which the town claims as a landing field, but as no government air planes have landed there in the last two years we attempted to make do with distinguishing this field from any other field in the vicinity.

"At Missoula, Mont., has a large field, which is surrounded with two small, unlighted control towers. Gasoline and oil are available on field. However, the Commercial Club, if satisfied in service, will take care of visiting pilots, making all arrangements for gasoline and oil."

"At Spokane, Wash., is a commercial field known as the Foster-Hanson Airfield. Fuel is owned and operated and available on field. However, the Commerical Club, if satisfied in service, will take care of visiting pilots, making all arrangements for gasoline and oil."

"At Seattle, Wash., the government operates a field known as Sand Point Field. This field, particularly one way and another, is a good landing field, but the terrain is rough and some hill pass through which makes it very difficult to park out from the sky. The service received there was very good. There are no restaurants on the field."

"At Manhattan, Mont., is an emergency field, with wind vane. At one end this field had a large white circle which, though being neglected, is hardly distinguishable from the air. Field has many rods and wire grass most of the time

on it. However, a landing can be made on this field without difficulty. Commercial gasoline is available in town.

"Lowland Rockies" report will include descriptions of the airmen between Chicago, Milwaukee, Wis., Minneapolis, Minn., Fargo, N. D., Billings, S. D., Miles City, Mont., Helena, Mont., Manhattan, Mont., Miles City, Montana to Spokane, Wash., Spokane to Seattle, Wash. The above data is taken from the Bureau of Internal Revenue publications which are published from time to time by the office of the Chief of Air Service.

## Chicago News

By Jim Elms

Shorter journeys surround the sudden departure of James Black for Central America. Black left Monday morning, Dec. 10, in his Land Speeder, headed for Cuba, from where it is said he will cut across the Caribbean to Central America.



Mr. Adriano Balland, who recently landed the long distance of 38 mi. and who is engaged to marry Miss Pauline French center.

This is probably the first time that an OX masterful ship will undertake such a long and dangerous flight, and the story on Black's landing and alligations and written stories of the exploded regions should make a fascinating story. Black's record extends over an 800 mi. trip, partly in Mexico and partly in the U. S. The "Hornet" Wings, which it is agreed that a plane can find spare parts even in the most remote reaches in Mexico and can procure high test gas for the return journey somewhere at a corner gas station in the same filled desert.

The Chicago Air Park Space Field at 3rd Street has been closed for the winter season.

The Chicago Air Park Space Field is extensively flying through Ohio. Lieutenant Elyot arrived at Chelmsford Field, John 9, from Detroit in a DH-1 carrying four passengers. John Miles has lately carried several passengers to the Great Lakes Naval training station in his DH-1, landing in a small athletic field.

The Heath Airlines Co. is experimenting with a Miller carburetor installed overfed in an OXG engine.

December 24, 1931

AVIATION

## Kansas City News

By T. S. Deane Jr.

On Nov. 27 the Kansas City Chapter of the National Aero Modelers Association held the first biplane meeting and the following race in the new field at Nichols Hills. Hosts: Howard F. Walker, Vice Pres. Walter H. Miller, Secy. E. M. Deeds, Tom Clif Hogan, Director, Major Frank Councill, Herbert Lester, Bayes M. Smith, Fred Harvey, and M. H. Etchells. The Chapter starts with a membership of 317 members, 100 members of Kansas City, everyone of whom is interested in aviation.

As critics at Richards Field were on the increase last year due to the low fuel economy and the unsuccessful passing of 40 flights out of 56, of the Air Service Reserve Corps, by Capt. Wm. E. Spake, Flight Surgeon of the 5th Corps, the members of the Chapter have decided to ban the flying time for the month of Jan. 15 to 30 min.

The following student officers from Ft. Leavenworth, Kan., have a total of 16 to 18 mos.: Majors Wm. C. Sharpe, Maxwell Kirby, Wm. C. McCloud, J. A. Haugen, R. L. Wadsworth, and R. H. Custer. The following Reserve Officers are serving: Lt. Col. W. E. Bell, Capt. W. E. McCloud, Maj. R. E. Spake, Capt. G. H. Black, Capt. L. L. Baker, Lt. Col. H. W. Dugle, Capt. B. G. Griggs, W. E. Atkinson, and W. M. Campbell. Lt. Jas. B. Carroll flew for a total of 26 hr. in this month routine and exercises. Lieutenant Carroll made one cross-country during the month to Fairchild, Okla., to serve his brother, another HB for the use of the officers' wives.

On the average one train Airay ship has passed through each day for the month, the biggest of which were the Morris Bombers under the command of Capt. A. H. McCloud and Lt. L. A. Smith from Nichols Field to Kelly and the 1st Lt. C. E. Johnson from the Army base. On from Kelly to Ft. Leavenworth there were 10 Transports and 10 bombers, but missed one day and that was due to the biggest snow storm experienced by Kansas City since 1915.

On Dec. 18 The First Annual St. Louis Air Show, G.E.C. was held in the University Club of this city. G. E. Hill, pilot for the Lincoln Standard owned by Woodie Smith, was the first to land. The plane was a 1929 model and will not receive the flying title till the first out of eighteen, C. G. Martin has the engine out of his "Elongated," the first motorized plane, and is giving it a much needed evaluation as nearly every visiting pilot on the field wants to try his hand on such a big ship. W. E. French in particular has been a great help to the visitors.

John French, representing the American Photo Co., has made three trips to Europe and has gone to Germany, Italy, France, and Spain. He has also visited the Balkans, Russia, and Japan. He is also completing his instructions to Lt. E. M. McCuller who took his ship out last week. Lt. H. T. Tuckson is teaching three students to fly and expects to graduate them soon. A few days ago when French converts from the press at Lansing, Mich., stated Tuckson was called on to try his luck to spot them down the air. Several have been caught on the results.

## Consolidation of British Air Lines

An agreement has been reached on the plan of the British Air Ministry for the organization of a new air transport service which would absorb all the principal companies now operating in the country. The capital of the new company has been fixed at £1,000,000.

A board of directors has been selected, consisting of two representatives of the Air Ministry, two representatives of the British interests concerned, and one each from the Handley-Page Transport, Ltd., the Daimler Airway, the British Marine Navigation Co. and the British Air Line.

The new company will be formed gradually, but will probably be completed by March 31, 1932. The present machines (Handley-Page W.88B, and Supermarine Sea Eagle) will be continued in service, but reallocated to the routes for which they are best adapted.

The new company proposes to make a special effort to im-

prove the quantity of merchandise it carries, but will of course confine it to carrying passenger services. For the present it will operate the following routes:

- (1) London-Paris-Turkey
- (2) London-Berwick-Cologne-Prague
- (3) Manchester-London-Austria-Greece-Hanover-Berlin.

At a later date it is hoped to extend the British services to the principal ports in Central Europe, and to establish the much desired London-Constanza-Madras-India services.

## Vincent Engineer Resigns

Vin Centoli, until recently chief design engineer of the Chance-Vought Corp. of Long Island City, N. Y., resigned from the corporation at the end of November. Mr. Centoli received a thorough technical education which he did exceptionally fine, and acted for about a year as design engineer for the French aircraft manufacturers. About 300 applicants have been invited for the French Government's competition for extension of seaplane routes and in this capacity he visited the principal aircraft plants in Europe, making studies of plant organization, cost, and manufacturing methods.

In the United States Mr. Centoli has been in connection with the Vought Corporation, designing and testing in the structural and aerodynamic departments of the Curtiss Aeroplane & Motor Corp.

## French Engine Competition

Cash prizes totaling two million francs are offered by the French Government for the construction of an aircraft designed to be held during the coming year. The object of the competition is to encourage the construction of aviation equipment developed from 300 to 500 kg. and capable of flying for long periods with the minimum of difficulties, thus giving the maximum guarantee of security in flight. After performance tests are made on each aircraft, the winners will have to undergo a 500 hr. endurance test, in normal flight, after which all aerial trials will be completed. Fuel consumption will be measured throughout the trials, and will be taken into consideration in making the final awards.

The total number of engines entered for this competition, which is the most important of its kind in the world, is believed to be 100, and the number of aircraft to be 100, each mounted with one engine of the competing firms of Farman and company, Roland, Potez, Latécoère-Duchêne and Hispano-Suiza with two engines each, and Salmson, Pégase, and Peugeot-Lorraine with one engine each.

## Chassis-Built Airplane

A ten-wheeler trucker loophole, with a 500-hp Mercedes engine, has just been disclosed at Langfang (near Shanghai), China. Every part of the plane was made by workmen who began without the slightest knowledge or experience of the class of work. The machine was designed and built by E. L. Sennett.

The principal characteristics of this machine are—Span, 30 ft. 6 in.; chord, 5 ft. 2 in.; length, 27 ft. 4 in.; wing area, 451 sq. ft.; weight empty, 1634 lb.; weight loaded, 2600 lb.; speed range 100 mi. per hr.; endurance, 4½ hr.

## Prairie Airplane Show, June, 1932

The Czechoslovak Aero Club intends to hold its third international aircraft exposition from June 3 to 14, 1932, at Prague. Details, including the date, are expected, will include large-type machines. The Czechoslovakia-Hellenic Co., at Prague, is now producing a certain number of airplane motors on order from the Czech government. These have the latest system of piston built in the country have been equipped with forged piston.

The address of the Czechoslovak Aero Club is Ceskoslovensky Aeroklub, Palác Českého Senátu, Václavské náměstí, Prague 1.

## Stromberg After Foreign Contracts

W. R. O'Neill of the Stromberg Carburetor Co. recently visited the Empire for the purpose of securing 1932 contracts for the company's products. New equipment which the company is now manufacturing will result, it is hoped, in increasing its foreign business.

# U. S. ARMY AND NAVY AIR FORCES

## U. S. ARMY AIR SERVICE

### Specialized Flying Training at Kelly Field

Specialized training in the four branches of aviation began at the Air Service Advanced Flying School at Kelly Field, Tex., on Nov. 2. The students now on duty at the Advanced Flying School have been assigned to the four branches of training, as follows:

**Pilotage instruction:** 2d Lts. Berg, W. Chidlow, H. M. Fletcher, Tompkins, James R. Griffith, O. B. Cook, Captain Frank B. Steiner, Davis W. Burford, John A. Coffey, Chas. N. Wadley, R. A. Glazebrook, Wm. H. McArthur and Marcus C. J. Morris.

**Strategic bombing:** Capt. E. C. Canfield, Second Lts. R. B. Stansbury, C. H. O'Connor, M. E. Gross, Alfred A. Kessell, Hugo F. Hatch, Cadets Frank F. Ray, Andrew R. Leesom, Lester Manning, Glen W. Allen, F. V. Thompson and P. J. Schermerhorn.

**Aircraft transport:** Major G. W. Waterman, Wm. B. Dury, First Lt. F. W. H. Kinzie, Second Lts. James W. Spangler, Milton Long, Cadets A. B. Smith, Gen. A. Wren, L. C. Sherman, L. G. Fritz and Schlegeler, Pfeiffer.

**Observation:** Maj. W. E. Bowld, A.S., M.C., Capt. Wm. H. Hale, First Lt. Harry T. Hart, F. E. Keeler, Capt. Wm. V. Thompson, 1st Lt. E. C. Coffey, Capt. W. E. Kessell, 2d Lt. W. Johnson, C. B. Smith, John G. Klemm, Major M. Murphy, Stanley R. Lamont and Earl W. Flott.

### Bombing Bomber Makes New Records

On Oct. 25, in the course of regular performance trials, the Martin Bomber piloted by Louis Moulé H. Morris and Max Fischbach, with Douglas Culver as observer, took off with 2,000 kg of bombs and reached an altitude of 6,000 ft. Over the speed course a speed of 85.5 m.p.h. was attained. Official representatives of the Federation Aeronautique Internationale were present.

On Oct. 27 the bombers again took off, this time carrying 1,000 kg of bombs, and reached an altitude of 6,000 ft., establishing the altitude and endurance record, carrying record for this load. F.A.I. officials observed the performance also. A maximum and endurance records were carried as does the record achieved concerning 350 gal of gas, oil and 12 gal of oil.

The Bombing Bomber has recently been equipped with radio, which increased the weight by 55 lb. The total load of the bomber as it took off was 3,035 lbs.

Horizon obtained the altitude and endurance records for 2,000 and 3,000 kg it planned to make another flight in the near future carrying 4,000 kg of bombs and establish this record also.

### Radio Instruction at French Field

Several weeks ago an order was issued at French Field, Panama Canal Zone, requiring all the officers to attend radio school and qualify in radio telegraphy. Two classes per day are held, one practice class and the other advanced. At present more than 50 per cent of the officers can take more than ten words per minute and all can take the five. After all officers have qualified they will be required to keep as practice by taking weekly tests.

### San Antonio Air Depot

The semi-annual report for July, 1923, of flying time for the Army Air Forces of the United States and its foreign possessions shows that 45 per cent of all flying performed that month was in single座 aircraft or overland at the San Antonio Air Intermediate Depot.

### Transcontinental Round Trip Completed

A Martin Bomber, capable of carrying 2,000 lbs. of explosives, 350 gal of gas, 25 gal of oil or a total load of approximately 30,000 lbs. including military equipment, landed safely at Point Barrow, Alaska, on the east leg of its round trip from the Pacific Coast. The other legs of the round trip were made from Seattle, Wash., to Fairbanks, Alaska, F. W. Wetmore and H. D. Smith, with Sergeants E. T. Chapman and A. B. Jewell as mechanics, all of the Army Air Service, and regularly stationed at Langley Field. The primary purpose of the flight was to determine the adaptability of a plane of such large capacity type as the Martin Bomber for regular travel along the Air Mail route, both for mail and passengers.

The flight from Seattle to the Pacific Coast was made in ten stages. Starting on Sept. 26, the airmen made stops at Dayton, O., St. Louis, Mo., where they witnessed the airplane meet, and Fort Leavenworth, Kan., where they participated in an aerial demonstration, after which they proceeded to the Midway Inn and took up residence at Wichita, Kas., Cheyenne, Colo., and Crissy Field, San Francisco.

The airmen experienced considerable difficulty in negotiating the winds of necessity from Rock Springs, Wyoming to Salt Lake City, Utah, on account of the low ceiling of this place. It resulted in an emergency altitude of 6,000 ft. and finally caused the plane to drop into the valley of Little Cottonwood Creek. Due to the thin air, the plane stalled about 1,500 ft. and flew 50 ft. above the ground.

The return trip from the Pacific coast was made via Yuma and Tucson, Ariz., El Paso, San Antonio and Dallas, Tex., Muskogee, Okla., Kansas City, Mo., St. Louis, Mo., Detroit, Washington.



Austria to United States and back in Martin Bomber.—The Army Air Service pilots and mechanics who did it (See story above.)



L. to R.: Lt. Louis H. O. Rogers, Ensign H. D. Palmer, Sergt. B. F. Fletcher and Sergt. P. P. Tolzakoff, of the Marine Corps, who just completed their 11,000 mi. flight.

### U. S. NAVAL AVIATION

#### Preparing the Polar Flight

The Naval Aviation Air Board, appointed by Secretary Denby, has been meeting frequently since its formation last week. The Board has called in experts on different phases of Arctic exploration and in considering the various forms that the expedition might take to best assure its success. The use of dirigibles, blimps and balloons has been considered, as also the possibility of making the flight in two stages.

With a view to increasing the life of the blimps used, the possibility of outfitting them with hydrogen was considered by some aeronauts. However, Secretary of the Navy Denby has ruled that helium alone shall be employed in the plans for the Arctic flight. As a consequence of the Board's decision, the Bureau of Navigation has been disbanded.

The Board will, in its consideration of the possible use of the U.S.S. Shenandoah for Arctic exploration, consider only the use of helium for inflation purposes.

The generosity of the research laboratories on the Arctic Ocean, a factor studied by the Board in determining the best point of departure for the expedition, may start in the exploration of the numerous islands in the Arctic. It has been suggested that the expedition will not be "a dash to the Pole," but rather will have a scientific character, and many discoveries of use to mankind in general are confidently expected as results of the project. The Board will coordinate the aeronautic and scientific work that has been formulated and submitted to the Secretary for his approval. Letters have been received from Arctic explorers, also these aeronauts, and wishing the Navy's explorers much success.

The Aerobiological Section of the Bureau of Navigation has been busy for the past few weeks collecting data on weather and air conditions for use in the Arctic by the proposed Naval Arctic Expedition. Lieut. F. W. Baderbridge, in charge of the Aerobiological Section, has been called upon a number of times to give information to the Board on weather conditions in the Arctic. In getting together the data, he has used the data obtained from the meteorological log of vessels that have been in the higher latitudes, as well as data from the few observations that exist in the far north has been supplemented by the logs and publications of various Arctic explorers.

Possibility of finding land in the most unexplored area of a nation square miles which lies between Point Barrow and the North Pole was pointed out to the Board by Lt. Cmdr. Elmer G. Green, member of the MacMillan polar expedition

of 1917. The probable existence of this land is a strong argument in favor of Alaska as a starting point for the polar flight.

Commodore Green pointed to the recent development in east Siberia which has made Siberia one of high economic value. He said that the region of the northern part of the Polar sea is like the volcanic island areas of the Atlantic where the Aleutian Island volcanic chain was evidence that similar land might be found in the million square-mile "land-spots" which a flight from Point Barrow would cover. The closer distance to the Pole of Ellesmere was considered by some members of the Board, but Captain Bartlett, and other polar explorers, believed that the sea in the region of Ellesmere would make it difficult to establish a base.

Commodore Green's theory of land mass in the Arctic region was supported by scientific testimony brought out by men who have visited the area.

Possibility that observations of air currents would be of value in weather prediction was also brought out. One point in Canada was probably famous as being "the place where the weather comes from"—that is, in Medicine Hat, where many of the storms break.

#### Marines Complete 11,000 Mi. Flight

The second longest flight in the world, and the longest American flight, has been completed by four Marine Corps flyers—Lts. Louis H. O. Rogers, Ensign H. D. Palmer, Sergt. B. F. Fletcher and Sergt. P. P. Tolzakoff, of the Marine Corps, who just completed their 11,000 mi. flight.

#### Liberty Engine Giving Exceptional Service

Installed on Oct. 18, 1923, in an H-2S engine, a Liberty engine at the Naval Air Station at Hampton Roads has had continuous service since that time with no major repair. The only service that the engine has received is the return of the propeller, which was replaced on Oct. 20, 1924. This engine has made 250 hr. in 55 days flight time, and is still going strong. In view of the fact that much of this time is represented by training flights, in which the engine received unusually hard service, this mark is considered quite remarkable.

#### DT4 with New Gasoline Tank

A flight of 5,760 mi., from the Naval Air Station at Anacostia, D. C. to the Naval Air Station at Pensacola, Fla., and return, was completed on Dec. 6 by Lt. F. W. Wood, U.S.N. The flight was made in a DT4 seaplane, with an extra tank, the gasoline tank carried in place of the gunner's seat, or fourth crew member, carrying service flights. The purpose of the flight was to test the new fuel tank, and also to test the operation and fuel consumption of the Wright T-2 engine, with which the plane is powered.

#### Boston Reserve Air Station

Flight to Boston from the Naval Reserve Air Station at Pensacola, Fla., over Florida, was made by the Boston Reserve Air Service on Dec. 13. The service, consisting of 120 men, was organized at the station at their own expense after having completed three years of duty, according to a report received from the commanding officer. This shows excellent spirit on the part of the students taking the course at the station, and is a good indication of the interest in aviation that has been generated by the Naval Reserve Air Station at Pensacola.

#### VT Squadron Twenty on Way to Asiatic Fleet

VT Squadron Twenty, recently organized at the Naval Air Station at San Diego, Calif., embarked on the U.S.S. Vicksburg for the Asiatic Fleet last week. Lt. Cmdr. G. D. Murray is the commanding officer of the squadron, and has with him the following officers: Lieut. A. G. Farwell, Lieut. C. Avery, Maxwell B. Green, Ed. B. Ross, James D. Lovings, William B. Shuster and Ensign (2d) Frederick W. McMahon.

**Orders to Officers**

Captain Robert W. Gabanas, detached U.S.S. Wright, to Naval Aircraft Factory, Mayport, Fla.; Lieutenant Edward F. Connelly, U.S. Navy, detached the Headquarters, Lt. Comdr. W. G. Moore, Naval Air Station, Pensacola, Fla.; Lt. Comdr. Allen G. Olson, Detached Officer in Charge Helium Production Plant, Fort Worth, Tex., to Battle Fleet; Lieutenant Frank J. Jester, detached Aircraft Squadrons Training Fleet, to V3 Squadron, Naval Air Stations, Anacostia, D. C.

Lieutenant George K. Kellner, MC, detached U.S.S. Sapsee, to Naval Air Station, Hampton Roads, Va.

Lieutenant Joseph B. Legan, MC, detached Naval Air Station, Hampton Roads, in Nav. Hump, Norfolk, Va.

Lieutenant Robert Pauls, detached Aircraft Squadrons Battle Fleet, re-designated accepted 12-20-21.

Lieutenant John P. Price, detached Aircraft Squadrons Battle Fleet to Naval Air Station, Pensacola, Fla., D. C.

Lieutenant Harry W. Brattin, detached Aircraft Squadrons Battle Fleet to Naval Air Station, Anacostia, D. C.

Lieutenant Frank H. Heff, detached U.S.S. Kearsarge, to trap duty, U.S.S. Wright.

Lieutenant George M. Hooser, detached U.S.S. Bainbridge, to trap duty, U.S.S. Wright.

Lieutenant Charles E. McElroy, detached Officer Naval Air Service, 21st Naval Air Group, and Staff Co., Philadelphia, to trap duty, U.S.S. Wright.

Lieutenant James G. Gresham Warren, detached Naval Air Station, Hampton Roads, to Aircraft Squadrons Battle Fleet.

Ensign John K. Lough, detached U.S.S. Tulsa, to trap duty, U.S.S. Wright.

Ensign Edward A. Maher, detached U.S.S. Utah, to trap duty, U.S.S. Wright.

Ensign Leroy H. Hudley, detached Aircraft Squadrons Battle Fleet to Naval Air Trap duty, with U.S.S. Wright.

Phariseus J. Wright, in Nav. Hump, Naval Air Station, Pensacola, Fla. (orders 12-27-21).

Lieutenant Joseph F. Bolger, det. U.S.S. Chester, Anacostia to U.S.S. Wright.

The above officers have been ordered to the Naval Air Station at Pensacola for temporary duty under instructions.

Lieutenant Miles E. Remond, Ensign, Lt. Comdr. Edward H. Andrus, Frederick R. Bass, John F. Green, William L. Eastman, John P. Griff, Lee L. Price, Kilburn H. Holt, George A. Morris, Bruce Settle, Mr. Senger, Felix E. Baker, Donald D. Blackinton, Charles C. Ferrell, Arthur L. Hamm, George E. Johnson, John L. Jones, Mr. K. L. Parker, Fred K. Williams, Eugene Williams, H. Sawyer, Ferdinand L. Kuhn, Ensign R. House, Charles R. Alexander, Charles R. Brown, Ensign R. A. Ford, Leslie R. Pollock.

**First CSN Plane Delivered**

The first of the CSN planes has been delivered at the Naval Air Station, Hampton Roads, and passed all contract requirements tests as a complete but incomplete. The plane had just passed the required tests as a biplane at Glendale City, Calif., and then flown to Anacostia from there.

The 4-60 is a three purpose plane for torpedo bombing, bombing and long range scouting, and is adaptable for use either as a single-seat or as a two-seater. It is powered with a 300-hp. engine, 60-gal. fuel tanks and the 400-lb. payload carrying capacity. The two main landing gear are later load by the Curtiss Aeroplane and Motor Co., from plans and spec sheets furnished by the Bureau of Aeronautics.

**VO Squadrons Six Being Organized**

The organization of VO squadrons has taken place at the Naval Air Station at Hampton Roads, Va. Lt. Comdr. A. E. MacGregor will be the commanding officer. VO Squadrons Six will be a part of the Aircraft Squadrons Training Fleet, and will be composed of MCO planes.

The first two of these planes have been shipped from the Glenn L. Martin factory at Cleveland and the remaining planes will be delivered soon. The third will be delivered. This squadron will not be built with the F-2s, as the other units of the aircraft Squadrons Training Fleet have, and will base at Hampton Roads for preliminary training.

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**PUBLISHER'S NEWS LETTER**

the engineer's standpoint. We are glad to hear that this policy is appreciated abroad.

And while we are on the subject of foreign interest in aviation, we might make reference to the Russian "Air Fleet Journal," which comes to us regularly. The publications of about 160 pages as it appears monthly, and even in Russia the advertisements seem to wish to keep the good will of the government, for there are no free advertisements in the last issue. The cover is of interest, as it shows a sleeked off emerging from a newly starting airplane and bears the caption "Ulyana." The slogan of Russia at not having an air force to cope with that of Great Britain during the most diplomatic difficulties is expressed in the following appeal: "Strengthen the military powers of the Soviet Republic and that will end having to give concessions to Imperialist Governments. Build up the Red Aeroflot for future warfare. The Soviet Government, in memory of the English situation, therefore calls to all citizens to subscribe towards the creation of an efficient aerial fleet." Filled as it is with technical articles, it indicates that the statement of Trotsky that "in the all nations must exist" is being taken literally in Russia.

Occasionally a reader writes and asks why we do not use larger type in the text so that it would be easier to read. This is a very proper question and probably other readers will be glad to know why we use about the same size type as the *Saturday Evening Post*, the widest read publication in the world. The reason is that we can give our readers in ten pages what other publications take fifteen to twenty-five pages. For this reason alone do we keep the size of our type to that used by the leading magazines. If they can be read, nearly all types of *AVIATION's* studies are much better and can read *AVIATION's* type without a magnifying glass. And they get just that much more good reading!







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